

TRG Math Pacing Guide			
Grade: 6			
Trimester 1			
September	October	November	
5.NBT.A.1; 5.NBT.A.2; 5.NBT.A.3; 5.OA.A.2; 5.NF.B.3; 5.NF.B.4; 5.NF.B.7	6.EE.A.1; 6.EE.A.2; 6.EE.A.2.a; 6.EE.A.2.b; 6.EE.A.2.c; 6.EE.A.3; 6.EE.A.4	6.EE.B.5; 6.EE.B.6; 6.EE.B.7; 6.EE.B.8; 6.EE.C.9	
Individual School Improvement Standards			
Individual Classroom Intervention Standards			
Trimester 2			
December	January	February	
6.NS.A.1 6.NS.B.2; 6.NS.B.3; 6.NS.B.4; 6.RP.A.1; 6.RP.A.2	6.RP.A.3; 6.RP.A.3.a; 6.RP.A.3.b; 6.RP.A.3.c; 6.RP.A.3.c	6.G.A.1; 6.G.A.2; 6.G.A.4; 6.SP.A.1; 6.SP.A.2	
Individual School Improvement Standards			
Individual Classroom Intervention Standards			
Trimester 3			
March	April	May	June
6.SP.A.3; 6.SP.B.4; 6.SP.B.5; 6.SP.B.5.a; 6.SP.B.5.b;	6.NS.C.5; 6.NS.C.6; 6.NS.C.6a; 6.NS.C.6.b; 6.NS.C.6.c;	6.NS.7.c; 6.NS.C.7a; 6.NS.C.7b; 6.NS.7.c; 6.NS.7.d;	6.NS.C.8; 6.G.A.3; 6.EE.A.3; 6.EE.A.4; 6.EE.B.6; 6.EE.B.8;

6.SP.B.5.c; 6.SP.B.5.d			6.NS.C.5; 6. NS.C.6; 6.RP.A.1; 6.RP.A.3; 6.SP.A.1
Individual School Improvement Standards			
Individual Classroom Intervention Standards			

GRADE: 6		SUBJECT: Math UNIT: Ratios	STRAND: Ratio and Proportional Relationships	TRG Math Pacing Guide
CODE: 6.RP.A.1 KNOWLEDGE	Description: Understand what a ratio is and use language to describe the relationship between two quantities.			
	ACT/Anchor Standard: Make sense of problems and persevere in solving them Reason abstractly and quantitatively			
	Board Objective: I CAN understand and describe a real world situation by writing a ratio to illustrate a relationship between two quantities.			
ASSESSMENTS:		CONCEPT NOTES:		STRATEGIES
Formative: Use dry/erase boards for quick comprehension checks: i.e. - what is a ratio? Performance tasks: Give real-life story problems related directly to objective i.e. - what is the ratio of ears to noses for students in this room? What would the ratio be tomorrow if 4 students were absent?		The emphasis on this standard is on the knowledge and application of ratios. The students must be able to comprehend the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. <i>For example, “The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak.” “For every vote candidate A received, candidate C received nearly three votes.”</i> Task Analysis: <ul style="list-style-type: none">• Explain that a ratio is a comparison of the quantities of two things• Write a ratio in the three standard forms (3 to 5, 3:5, 3/5)• Calculate equivalent ratios (similar to fraction operations)• Convert ratio terminology into mathematical relationships in real world situations Students develop the understanding that ratio is a comparison of two numbers or quantities. Ratios that are written as part-to-whole are comparing a specific part to the whole.		Concrete: (include manipulatives) i.e.- students will use rubber ducks to count how many wings there are to beaks Pictorial: (include drawings, diagrams, charts, or graphs) i.e.- students will draw each duck and label their wings and beak Abstract: (symbolic representations such as numbers or letters) i.e.- students will write out their story problem using the correct mathematical symbols 2:1 (for every duck in the pond there were 2 wings to every beak) Relate to fractions= /
RESOURCES:			VOCABULARY:	
http://www.robeson.k12.nc.us/Page/32959 http://engageny.org/resource/curriculum-exemplars/ https://grade6commoncoremath.wikispaces.hcps.org			Ratio Equivalent ratio	
ESSENTIAL QUESTIONS:				
<ul style="list-style-type: none">- WHAT IS A RATIO?- WHAT MAKES A RATIO EQUIVALENT?				

GRADE: 6		SUBJECT: Math		STRAND: Ratio and Proportional Relationships		TRG Math Pacing Guide	
CODE: 6.RP.A.3.a Application	Description: Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equation.						
	ACT/Anchor Standard: Use appropriate tools strategically Attend to precision Look for and make use of structure						
	Board Objective: I CAN use ratios to solve real world problems using tables and graphs.						
ASSESSMENTS:		CONCEPT NOTES:					STRATEGIES
Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – What is the missing value in the table? Performance tasks: Give real-life story problems related directly to objective i.e. – By 2012, the ratio of boys to girls was 3 to 7. If there were 200 more girls than boys in 2012, how many boys were enrolled that year? Use a table, graph, or diagram to justify your answer.		The emphasis on this standard is to make tables of equivalent ratios relating quantities with whole number measurements, find missing values in the tables. Use tables to compare ratios. Other ways to illustrate ratios that will help students see the relationships follow. Begin written representation of ratios with the words “out of” or “to” before using the symbolic notation of the colon and then the fraction bar; for example, 3 out of 7, 3 to 5, 6:7 and then 4/5. Use skip counting as a technique to determine ratio equivalence. Task Analysis: <ul style="list-style-type: none">Identify relationships in ratio tables to plot pairs of values from the tablesDetermine missing values of tables using ratios and cross-multiplication (set up a proportion)Make tables of equivalent ratiosUse ratio and proportional reasoning to solve real world problemsSet up unit rate problems correctly involving pricing and constant speed					Concrete: (include manipulatives) i.e. - Students will use tangible measuring devices to see equivalence. Pictorial: (include drawings, diagrams, charts, or graphs) i.e. - Students will create a table of equivalent ratios. Abstract: (symbolic representations such as numbers or letters) i.e.- 50/100 = 50%
RESOURCES:				VOCABULARY:			
http://www.robeson.k12.nc.us/Page/32959 http://engageny.org/resource/curriculum-exemplars/				Tape diagrams Proportional reasoning Conversion		Double number line diagrams Percent Rate Percent	
ESSENTIAL QUESTIONS:							
<ul style="list-style-type: none">HOW DO I SET UP TABLES TO REPRESENT RATIO RELATIONSHIPS?HOW DO I COMPARE/CONTRAST VISUAL REPRESENTATIONS OF RATIO/PROPORTION RELATIONSHIPS?							

GRADE: 6		SUBJECT: Math	STRAND: Ratio and Proportional Relationships	TRG Math Pacing Guide
CODE: 6.RP.A.3.d Application	Description: Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.			
	ACT/Anchor Standard: Use appropriate tools strategically. Attend to precision. Look for and make use of structure.			
	Board Objective: I CAN use ratios to convert measurement correctly by multiplying or dividing.			
ASSESSMENTS:		CONCEPT NOTES:		STRATEGIES
<p>Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. - Percentages are ____ per ____.</p> <p>Performance tasks: Give real-life story problems related directly to objective i.e. - Within your group, adjust this recipe to find out how much of each ingredient you would need to feed your group.</p>		<p>The emphasis on this standard is to use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.</p> <p>Task Analysis:</p> <ul style="list-style-type: none"> • Solve real world problems using rate reasoning • Understand that percentages are a rate per 100 • Find the whole given a part and the percent • Find a percent of a quantity using rate • Convert metric measurement units using ratio reasoning • Convert customary measurement units using ratio reasoning <p>Fractions and percents are examples of part-to-whole ratios. Fractions are written as the part being identified compared to the whole amount. A percent is the part identified compared to the whole (100). Provide students with multiple examples of ratios, fractions and percents of this type.</p> <p><i>For example, the number of girls in the class (12) to the number of students in the class (28) is the ratio 12 to 28.</i></p>		<p>Concrete: (include manipulatives) i.e. - Students will use tangible measuring devices to see equivalence.</p> <p>Pictorial: (include drawings, diagrams, charts, or graphs) i.e. - students will use a map to find distances between two towns.</p> <p>Abstract: (symbolic representations such as numbers or letters) i.e. - Students will write distance and create/solve equation in numeric/symbolic form.</p>
RESOURCES:			VOCABULARY:	
http://www.roberson.k12.nc.us/Page/32959 http://engageny.org/resource/curriculum-exemplars/			Metric system Coordinate plane	Customary units of measure Equivalent fractions
ESSENTIAL QUESTIONS:				

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- WHAT IS AN ALGORITHM?
- HOW CAN I APPLY ALGORITHM TO REAL-WORLD PROBLEMS?

GRADE: 6		SUBJECT: Math UNIT: Rates, including percent	STRAND: The Number System	TRG Math Pacing Guide
CODE: 6.NS.C.8 APPLICATION	Description: Apply and extend previous understandings of numbers to the system of rational numbers. Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.			
	ACT/Anchor Standard: Reason abstractly and quantitatively Model with mathematics Attend to precision			
	Board Objective: I CAN plot points on a coordinate plane and use absolute value to find the distance between two points.			
ASSESSMENTS:		CONCEPT NOTES:		STRATEGIES
Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – Draw a coordinate plane containing all 4 quadrants and x, y axis. Performance tasks: Give real-life story problems related directly to objective i.e. – Use a double line graph to illustrate the difference in price between two stores for a can of vegetables.		The learner will apply knowledge of graphing skills to plot coordinates and derive distances between the points using all four quadrants. Task Analysis: <ul style="list-style-type: none"> • Identify and label the x-axis and the y-axis of the coordinate plane. • Identify and label all four quadrants of the coordinate plane. • Identify the x coordinate and y coordinate position in an ordered pair. • Plot the ordered pair • Find distances between points on a coordinate plane. • Graph points on the coordinate plane to replicate real world situations. Students must be able to place rational numbers on a number line (6.NS.C.7) before they can place ordered pairs of rational numbers on a coordinate plane. When students work with rational numbers in the coordinate plane to solve problems, they combine and consolidate elements from other standards in this cluster. Examples of Opportunities for Connections among Standards, Clusters, or Domains: Plotting rational numbers in the coordinate plane is part of analyzing proportional relationships (6.RP.A.3a and 7.RP.A.2) and will become important for studying linear equations (8.EE.C.8) and graphs of functions (8.F).		Concrete: (include manipulatives) i.e. – http://www.pencils.com/story-pencils Pictorial: (include drawings, diagrams, charts, or graphs) i.e. – In small group have students create a template for designing a coordinate plane. Abstract: (symbolic representations such as numbers or letters) i.e. – Students will make a number sentence/equation from concrete example (story problem).
RESOURCES:			VOCABULARY:	
http://www.roberson.k12.nc.us/Page/32959 http://education.ohio.gov			x-axis quadrant	y-axis origin ordered pair plot coordinate plane coordinates

ESSENTIAL QUESTIONS:

How can I model and represent rates and ratios?

CODE: 6.RP.A.2 APPLICATION	Description: Understand ratio concepts and use ratio reasoning to solve problems.	
	ACT/Anchor Standard: Make sense of problems and persevere in solving them Reason abstractly and quantitatively	
	Board Objective: I CAN ratio reasoning to solve for unit rates.	
ASSESSMENTS:	CONCEPT NOTES:	STRATEGIES
<p>Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – “If I have 2 eggs to every 1 cup of flour, how many eggs will I need for 5 cups of flour?”</p> <p>Performance tasks: Give real-life story problems related directly to objective i.e. – Using example have students complete and expand to real life scenario.</p>	<p>The emphasis on this standard is to understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship.</p> <p><i>For example, “This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is $3/4$ cup of flour for each cup of sugar.” “We paid \$75 for 15 hamburgers, which is a rate of \$5 per hamburger.”</i></p> <p>NOTE: Expectations for unit rates in this grade are limited to non---complex fractions.</p> <p>Task Analysis:</p> <ul style="list-style-type: none">• Define unit rate and rate• Recognize a ratio written as a unit rate• Convert a ratio to a unit rate <p>Rates, a relationship between two units of measure, can be written as ratios, such as miles per hour, ounces per gallon and students per bus. For example, 3 cans of pudding cost \$2.48 at Store A and 6 cans of the same pudding costs \$4.50 at Store B. Which store has the better buy on these cans of pudding? Various strategies could be used to solve this problem:</p> <ul style="list-style-type: none">• A student can determine the unit cost of 1 can of pudding at each store and compare.• A student can determine the cost of 6 cans of pudding at Store A by doubling \$2.48.• A student can determine the cost of 3 cans of pudding at Store B by taking $\frac{1}{2}$ of \$4.50.	<p>Concrete: (include manipulatives) i.e. – Use household measuring cups to practice.</p> <p>Pictorial: (include drawings, diagrams, charts, or graphs) i.e. – Labeling units helps students organize the quantities when writing proportions:</p> <div><div>3 eggs</div><div>=</div><div>z egg</div></div> <div><div>2 cups flour</div><div></div><div>8 cups flour</div></div> <p>Abstract: (symbolic representations such as numbers or letters) i.e. – Students will make a number sentence/equation from concrete example.</p>
RESOURCES:	VOCABULARY:	
http://www.roberson.k12.nc.us/Page/32959 http://education.ohio.gov	Unit rate Non-complex fractions (not a mixed number) Proportion Rate	
ESSENTIAL QUESTIONS:		
How and where are ratios and rates used in the real world? How can I model and represent rates and ratios?		

GRADE: 6		SUBJECT: Math UNIT: Rates, including percent	STRAND: Ratio and Proportional Relationships	TRG Math Pacing Guide
CODE: 6.RP.A.3.b APPLICATION	Description: Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.			
	ACT/Anchor Standard: Use appropriate tools strategically Attend to precision Look for and make use of structure			
	Board Objective: I CAN solve unit rate problems including pricing and constant speed.			
ASSESSMENTS:		CONCEPT NOTES:		STRATEGIES
<p>Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – When have you heard/seen a “unit rate”?</p> <p>Performance tasks: Give real-life story problems related directly to objective i.e. – Use one example from concept notes for students to complete in small group. Provide further reflection questions. “How many lawns could be mowed in 25 hours?”</p>		<p>The emphasis on this standard is to solve unit rate problems including those involving unit pricing and constant speed.</p> <p><i>For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?</i></p> <p><i>Example: Tom shoveled snow from his driveway and the driveways of 3 of his neighbors. Mike shoveled snow from 6 driveways. Tom started at 3:00pm and finished at 6:45pm. Mike started at 11:00am and finished 30 minutes before Tom started. Each driveway in Tom’s neighborhood is 100 feet long while each driveway in Mike’s neighborhood is 25 yards long. Tom and Mike both have the same size shovel and each neighborhood has 4 inches of snow on the ground. Who shoveled at a faster rate?</i></p> <p>Task Analysis:</p> <ul style="list-style-type: none"> Identify relationships in ratio tables to plot pairs of values from the tables Determine missing values of tables using ratios and cross-multiplication (set up a proportion) Make tables of equivalent ratios Use ratio and proportional reasoning to solve real world problems Set up unit rate problems correctly involving pricing and constant speed 		<p>Concrete: (include manipulatives) i.e. – Students will use grocery items to solve for unit rate.</p> <p>Pictorial: (include drawings, diagrams, charts, or graphs) i.e. – Students will graph their findings to represent the best unit price.</p> <p>Abstract: (symbolic representations such as numbers or letters) i.e. – Students will make a number sentence/equation from concrete example.</p>
RESOURCES:			VOCABULARY:	
http://www.roberson.k12.nc.us/Page/32959 http://education.ohio.gov			Equivalent ratios Proportional reasoning Conversion	Tape diagrams Percent Double number line diagrams 10 x10 grids
ESSENTIAL QUESTIONS:				

Why is it important to know how to solve for unit rates?

How is a ratio or rate used to compare two quantities or values?

GRADE: 6		SUBJECT: UNIT: Rates, including percent	STRAND: Ratio and Proportional Relationships	TRG Math Pacing Guide
CODE: 6.RP.A.3.c APPLICATION	Description: Use ratio and rate reasoning to solve real--world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.			
	ACT/Anchor Standard: Use appropriate tools strategically Attend to precision Look for and make use of structure			
	Board Objective: I CAN find a percent of quantity as a rate per 100.			
ASSESSMENTS:		CONCEPT NOTES:		STRATEGIES
Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – “What percent is 2/10?” Performance tasks: Give real-life story problems related directly to objective i.e. – “You are creating a backsplash for your kitchen that is 18 in. by 2 ft. If you want 25% of the backsplash to be yellow and 75% to be green, how many 1 in. by 1 in. tiles will you need of each color?”		The emphasis on this standard is to find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent. Students' prior understanding of a skill with multiplication, division, and fractions contribute to their study of ratios, proportional relationships and unit rates. When students work toward meeting standard 6.RP.A.3, they use a range of reasoning and representations to analyze proportional relationships. Percents are often taught in relationship to learning fractions and decimals. This cluster indicates that percents are to be taught as a special type of rate. Provide students with opportunities to find percents in the same ways they would solve rates and proportions. Task Analysis: <ul style="list-style-type: none"> • Solve real world problems using rate reasoning • Understand that percentages are a rate per 100 • Find the whole given a part and the percent • Find a percent of a quantity using rate 		Concrete: (include manipulatives) i.e. – Use backsplash tiles to model percent quantities. Pictorial: (include drawings, diagrams, charts, or graphs) i.e. – Draw a diagram including measurements of backsplash. Abstract: (symbolic representations such as numbers or letters) i.e. – Students will make a number sentence/equation from concrete example.
RESOURCES:			VOCABULARY:	
http://www.roberson.k12.nc.us/Page/32959 http://education.ohio.gov			Proportional reasoning	Percent Conversion
ESSENTIAL QUESTIONS:				
What are similarities and differences between fractions and ratios?				

GRADE: 6		SUBJECT: Math UNIT: Multi-digit computation and finding common factors & multiples	STRAND: The Number System	TRG Math Pacing Guide
CODE: 6.NS.B.2 APPLICATION	Description: Compute fluently with multi-digit numbers and find common factors and multiples.			
	ACT/Anchor Standard: Reason abstractly and quantitatively Look for and make use of structure			
	Board Objective: I CAN divide multi-digit numbers.			
ASSESSMENTS:		CONCEPT NOTES:		STRATEGIES
Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – Provide multi-digit division problem. Performance tasks: Give real-life story problems related directly to objective i.e. - The PTA baked 804 cookies for the winning class. If each of the 25 students in Mr. Hall's first period students will receive an equal share of cookies, how many cookies should each student receive?		The emphasis on this standard is to fluently divide multi-digit numbers using the standard algorithm. Students are expected to fluently divide multi-digit numbers using the standard algorithm. This is the culminating standard for several years' worth of work with division of whole numbers. Fluency is something that develops over time; practice should be given over the course of the year as students solve problems related to other mathematical studies. Opportunities to determine when to use paper pencil algorithms, mental math or a computing tool is also a necessary skill and should be provided in problem solving situations. Task Analysis: <ul style="list-style-type: none">• apply the divisibility rules (for 2,3,4,5,6,9,10) to division problems• divide single-digit division problems• Set up correctly a multi-digit division problem• Divide multi-digit numbers		Concrete: (include manipulatives) i.e. – Pictorial: (include drawings, diagrams, charts, or graphs) i.e. – Abstract: (symbolic representations such as numbers or letters) i.e. –
RESOURCES:			VOCABULARY:	
http://www.roberson.k12.nc.us/Page/32959 http://education.ohio.gov			algorithm algorithm factors	
ESSENTIAL QUESTIONS:				

How is division of fractions used in the real world?

GRADE: 6		SUBJECT: Math UNIT: Multi-digit computation and finding common factors & multiples		STRAND: The Number System		TRG Math Pacing Guide	
CODE: 6.NS.B.4 EVALUATION	Description: Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. <i>For example, express $36 + 8$ as $4(9 + 2)$.</i>						
	ACT/Anchor Standard: Reason abstractly and quantitatively Look for and make use of structure						
	Board Objective: I CAN evaluate a given set of numbers to derive the GCF, LCM, and common factors using the distributive property.						
ASSESSMENTS:		CONCEPT NOTES:				STRATEGIES	
Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – “What is GCF, LCM?” Performance tasks: Give real-life story problems related directly to objective i.e. -		Greatest common factor and least common multiple are usually taught as a means of combining fractions with unlike denominators. This cluster builds upon the previous learning of the multiplicative structure of whole numbers, as well as prime and composite numbers in Grade 4. Although the process is the same, the point is to become aware of the relationships between numbers and their multiples. <i>For example, consider answering the question: “If two numbers are multiples of four, will the sum of the two numbers also be a multiple of four?”</i> Another focus is to be able to see how the GCF is useful in expressing the numbers using the distributive property, $(36 + 24) = 12(3+2)$, where 12 is the GCF of 36 and 24. Task Analysis: <ul style="list-style-type: none">• Apply the divisibility rules to derive prime numbers• Derive factors of a given number• Derive prime factorization of given numbers• Determine GCF of a given set of numbers• Determine LCM of a given set of numbers• Apply GCF and LCM to solve word problems• Apply the distributive property to express any sum as a multiple of a GCF and the sum of two whole numbers				Concrete: (include manipulatives) i.e. – Pictorial: (include drawings, diagrams, charts, or graphs) i.e. – Abstract: (symbolic representations such as numbers or letters) i.e. – make a number sentence/equation from concrete example.	
RESOURCES:		VOCABULARY:					
http://www.roberson.k12.nc.us/Page/32959 http://education.ohio.gov		Prime number Common Factor Factor tree Greatest common factor		Composite number Prime Factor Exponent		Factor Prime factorization Least common multiple Distributive property	
ESSENTIAL QUESTIONS:							

What is the difference between factors and multiples?
How can I use the distributive property in real-life situations?

GRADE: 6		SUBJECT: Math UNIT: Dividing fraction	STRAND: The Number System	TRG Math Pacing Guide
CODE: 6.NS.A.1 APPLICATION	Description: Apply and extend previous understandings of multiplication and division to divide fractions by fractions.			
	ACT/Anchor Standard: Make sense of problems and persevere in solving them Model with mathematics Use appropriate tools strategically			
	Board Objective: I CAN apply division algorithms by dividing fractions by fractions in equations and word problems.			
ASSESSMENTS:		CONCEPT NOTES:		STRATEGIES
Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – Provide two fractions to divide. Performance tasks: Give real-life story problems related directly to objective i.e. – Use example and provide follow up questions.		The emphasis on this standard is to interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. <i>For example, create a story context for $(2/3) \div (3/4)$ and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that $(2/3) \div (3/4) = 8/9$ because $3/4$ of $8/9$ is $2/3$. (In general, $(a/b) \div (c/d) = ad/bc$.) How much chocolate will each person get if 3 people share $1/2$ lb of chocolate equally? How many $3/4$-cup servings are in $2/3$ of a cup of yogurt? How wide is a rectangular strip of land with length $3/4$ mi and area $1/2$ square mi?</i> Computation with fractions is best understood when it builds upon the familiar understandings of whole numbers and is paired with visual representations. Solve a simpler problem with whole numbers, and then use the same steps to solve a fraction divided by a fraction. Looking at the problem through the lens of “How many groups?” or “How many in each group?” helps visualize what is being sought. Task Analysis: <ul style="list-style-type: none">• Connect the division of a whole number by a fraction to its inverse operation using multiplication• Create mnemonic device for the sequence of steps for calculating quotients of two fractions• Use fraction division to solve word problems• Interpret and compute quotients of fractions		Concrete: (include manipulatives) i.e. – use measurement tools to demonstrate Pictorial: (include drawings, diagrams, charts, or graphs) i.e. – create a picture that represents problem Abstract: (symbolic representations such as numbers or letters) i.e. – make a number sentence/equation from concrete example
RESOURCES:			VOCABULARY:	

http://www.roberson.k12.nc.us/Page/32959 http://education.ohio.gov	reciprocal simplest form fraction model	simplified mixed number improper	reduced fraction
ESSENTIAL QUESTIONS:			
HOW DO I DIVIDE TWO FRACTIONS?			

GRADE: 6		SUBJECT: Math UNIT: Representing Relationships	STRAND: Expressions and Equations	TRG Math Pacing Guide
CODE: 6.EE.B.6 APPLICATION	Description: Reason about and solve one---variable equations and inequalities.			
	ACT/Anchor Standard: Reason abstractly and quantitatively Model with mathematics Look for and make use of structure			
	Board Objective: I CAN use variables to represent numbers and solve expressions.			
ASSESSMENTS:		CONCEPT NOTES:		STRATEGIES
Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – $2.50x - 3$ Performance tasks: Give real-life story problems related directly to objective i.e. – An amusement park charges \$23.99 for admissions and \$0.30 per ticket. Write an algebraic expression to represent the total amount spent.		The emphasis of this standard is to use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. Task Analysis: <ul style="list-style-type: none">• Define variables in a given situation• Read expressions with variables• Write expressions with variables• Write expressions to represent a given real world situations Provide opportunities for students to write expressions for numerical and real-world situations. Write multiple statements that represent a given algebraic expression. For example, the expression $x - 10$ could be written as “ten less than a number,” “a number minus ten,” “the temperature fell ten degrees,” “I scored ten fewer points than my brother,” etc. Students should also read an algebraic expression and write a statement		Concrete: (include manipulatives) i.e. – create algebraic sentence strips for students to solve in partners Pictorial: (include drawings, diagrams, charts, or graphs) i.e. – design a chart of common formulas Abstract: (symbolic representations such as numbers or letters) i.e. – make a number sentence/equation from concrete example
RESOURCES:		VOCABULARY:		

http://www.roberson.k12.nc.us/Page/32959 http://education.ohio.gov	Algebraic expression Term Inequality	Evaluate Coefficient Constant	Variable Equation
ESSENTIAL QUESTIONS:			
How can expressions with exponents be simplified? Why does this strategy work?			
What does it mean for expressions with variables to be equivalent?			

GRADE: 6		SUBJECT: Math UNIT: Representing Relationships	STRAND: : Expressions and Equations	TRG Math Pacing Guide
CODE: 6.EE.C.9 APPLICATION	Description: Represent and analyze quantitative relationships between dependent and independent variables.			
	ACT/Anchor Standard: Look for and make use of structure Look for and express regularity in repeated reasoning			
	Board Objective: I CAN analyze the relationship between dependent and independent variables in equations by comparing the table, graph and/or equation to interpret data from a word problem.			
ASSESSMENTS:		CONCEPT NOTES:		STRATEGIES
<p>Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – “what is an independent/dependent variable?”</p> <p>Performance tasks: Give real-life story problems related directly to objective i.e. – Translate the statement into a mathematical equation, and then complete the function table: y is equal to two more than the product of x and 3.</p>		<p>The emphasis of this standard is to use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.</p> <p><i>For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation $d = 65t$ to represent the relationship between distance and time.</i></p> <p>Task Analysis:</p> <ul style="list-style-type: none"> • Recognize the dependent variable is on the y-axis • Recognize the Independent variable is on the x-axis • Recognize that the independent variables can be changed • Recognize that the dependent variable is affected by the change in the independent variable • Analyze the relationship between dependent and independent variables by comparing the table, graph and/or equation. • Interpret data from a word problem and create an equation 		<p>Concrete: (include manipulatives) i.e. – Pictorial: (include drawings, diagrams, charts, or graphs) i.e. – create a function table (http://illuminations.nctm.org/LessonDetail.aspx?id=L586) Abstract: (symbolic representations such as numbers or letters) i.e. – Fill in your function table using variables, numbers and equations</p>

RESOURCES:	VOCABULARY:
http://www.roberson.k12.nc.us/Page/32959 http://education.ohio.gov	Dependent variable Independent variable Discrete data Proportional relationship Quantities Function table Constant Coordinate plane
ESSENTIAL QUESTIONS:	
How can you represent solutions to inequalities? How can you determine if a variable is independent or dependent? How can an equation be used to represent a situation or data table?	

GRADE: 6	SUBJECT: Math UNIT: Extending the number system	STRAND: The Number System	TRG Math Pacing Guide
CODE: 6.NS.C.5 APPLICATION	Description: Apply and extend previous understandings of numbers to the system of rational numbers.		
	ACT/Anchor Standard: Model with mathematics Reason abstractly and quantitatively Attend to precision		
	Board Objective: I CAN apply knowledge of integers by describing quantities that represent real world content with positive, negative, and zero values.		
ASSESSMENTS:	CONCEPT NOTES:	STRATEGIES	
Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – “Give me an example of a positive/negative integer.” Performance tasks: Give real-life story problems related directly to objective i.e. – use figurethis.org or use a prompt.	The emphasis of this standard is to understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. Students will begin the study of the existence of negative numbers, their relationship to positive numbers and the meaning and uses of absolute value. Starting with examples of having/owing and above/below zero sets the stage for understanding that there is a mathematical way to describe opposites <i>For example: Demonstration of understanding of positives and negatives involves translating among words, numbers and models: given the words “7 degrees below zero” showing it on a thermometer and writing -7; given -4 on a number line, writing a real-life example and mathematically -4. Number lines also give the opportunity to model absolute value as the distance from zero.</i>	Concrete: (include manipulatives) i.e. – Students will use number cards and identify the numbers as “above or below zero”. Pictorial: (include drawings, diagrams, charts, or graphs) i.e. – Students will draw a thermometer and place the given degrees above or below 0. Abstract: (symbolic representations such as numbers or letters) i.e. – Students will be able to create a number sentence using positive/negative numbers and	

	<p>Task Analysis:</p> <ul style="list-style-type: none">• Create a number line representing positive and negative numbers and zero.• Locate and identify positive and negative numbers on a number line.• Illustrate real world situations where positive and negative numbers are found and used.• Explain the meaning of zero in real world situations.• Identify the opposite value of integers.	degrees.				
RESOURCES:		VOCABULARY:				
http://mathstar.lacoe.edu/lessonlinks/integers/integers_main.html http://education.ohio.gov http://www.figurethis.org/challenges/c46/answer.htm		Integer	Positive	Negative	Deposit	Withdraw
		Debit	Credit	Rise	Fall	Vertical
		Horizontal				
ESSENTIAL QUESTIONS:						
What is the meaning of positive and negative numbers and zero in real-life situations? How and why are rational numbers ordered? How and why is absolute value ordered?						

GRADE: 6		SUBJECT: Math UNIT: Extending the number system	STRAND: The Number System	TRG Math Pacing Guide
CODE: 6.NS.6.a APPLICATION	Description: Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.			
	ACT/Anchor Standard: Reason abstractly and quantitatively Model with mathematics Attend to precision			
	Board Objective: I CAN identify positive and negative integers and where they are located on a number line.			
ASSESSMENTS:		CONCEPT NOTES:		STRATEGIES
Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – “What is the opposite number of - 4?” Performance tasks: Give real-life story problems related directly to objective i.e. – “If Jon has ½ a bag of cookies, Ron ¾ bags and Don lost 3 bags who has the most cookies left?”		The emphasis of this standard is to recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., $-(-3) = 3$, and that 0 is its own opposite. Task Analysis: <ul style="list-style-type: none">Locate the appropriate placement of numbers on a number line, including fractions and decimals. Using number lines to model negative numbers, prove the distance between opposites, and understand the meaning of absolute value easily transfers to the creation and usage of four-quadrant coordinate grids.		Concrete: (include manipulatives) i.e. – Use a number line to identify +/- integers. Pictorial: (include drawings, diagrams, charts, or graphs) i.e. – Create a number line for assignment use. Abstract: (symbolic representations such as numbers or letters) i.e. – When give a math story prompt, students will be able to create a numeric sentence and solve.
RESOURCES:			VOCABULARY:	
http://www.roberson.k12.nc.us/Page/32959 http://education.ohio.gov http://ccsstoolbox.agilemind.com/parcc/about_middle_3794.html			rational number negative integer	absolute value positive integer
ESSENTIAL QUESTIONS:				
What is the meaning of positive and negative numbers and zero in real-life situations? How and why are rational numbers ordered? How and why is absolute value ordered?				

GRADE: 6		SUBJECT: Math UNIT: Extending the number system	STRAND: The Number System	TRG Math Pacing Guide
CODE: 6.NS.7.a APPLICATION	Description: Understand ordering and absolute value of rational numbers.			
	ACT/Anchor Standard: Reason abstractly and quantitatively Model with mathematics			
	Board Objective: I CAN describe the value of rational numbers by using a number line to compare inequalities.			
ASSESSMENTS:		CONCEPT NOTES:		STRATEGIES
<p>Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – “Solve the inequality $7 ___ 4.3$”</p> <p>Performance tasks: Give real-life story problems related directly to objective i.e. – Lucy owed her mom \$3.50, and Hannah owed her mom \$4.75. Who owed more? (plot on number line)</p>		<p>The emphasis of this standard is to interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.</p> <p><i>For example, interpret $-3 > -7$ as a statement that -3 is located to the right of -7 on a number line oriented from left to right</i></p> <p>Simple comparisons can be made and order determined. Order can also be established and written mathematically: $-3^\circ \text{C} > -5^\circ \text{C}$ or $-5^\circ \text{C} < -3^\circ \text{C}$. Finally, absolute values should be used to relate contextual problems to their meanings and solutions.</p> <p>Task Analysis:</p> <ul style="list-style-type: none"> Recognize horizontal and vertical number lines Plot rational numbers on a number line that describe real world situations Recall symbols of inequalities ($<$, $>$) Compare the value of rational numbers on a number line 		<p>Concrete: (include manipulatives) i.e. – Use number line or thermometer to aid in answering discussion questions.</p> <p>Pictorial: (include drawings, diagrams, charts, or graphs) i.e. – Create illustrations of greater or less than quantities.</p> <p>Abstract: (symbolic representations such as numbers or letters) i.e. – Students will be able to recall meaning for symbols: $=, <, >,$, $-$</p>
RESOURCES:			VOCABULARY:	
http://www.roberson.k12.nc.us/Page/32959 http://education.ohio.gov http://www.mathsisfun.com/equal-less-greater.html http://www.yummymath.com/2011/hot-summer-cold-winter/			Absolute value Greater than	Inequality Less than Rational number
ESSENTIAL QUESTIONS:				
<p>What is the meaning of positive and negative numbers and zero in real-life situations?</p> <p>How and why are rational numbers ordered? How and why is absolute value ordered?</p>				

GRADE: 6		SUBJECT: Math UNIT: Extending the number system		STRAND: The Number System		TRG Math Pacing Guide							
CODE: 6.NS.7.b APPLICATION	Description: Understand ordering and absolute value of rational numbers.												
	ACT/Anchor Standard: Reason abstractly and quantitatively Construct viable arguments and critique the reasoning of others												
	Board Objective: I CAN apply knowledge of rational numbers by ordering values in real world contexts.												
ASSESSMENTS:		CONCEPT NOTES:				STRATEGIES							
Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – “What is one way you use rational number comparisons every day?” Performance tasks: Give real-life story problems related directly to objective i.e. – (see “Apply”)		Write, interpret, and explain statements of order for rational numbers in real-world contexts. <i>For example, write $-3\text{ }^{\circ}\text{C} > -7\text{ }^{\circ}\text{C}$ to express the fact that $-3\text{ }^{\circ}\text{C}$ is warmer than $-7\text{ }^{\circ}\text{C}$.</i> Task Analysis: <ul style="list-style-type: none">Plot rational numbers on a number line that describe real world situationsRecall symbols of inequalities (<, >)Compare the value of rational numbers on a number line Apply: Ask students, “which of the following statements are true?” <table border="1"><thead><tr><th>Cake</th><th>Reading</th></tr></thead><tbody><tr><td>F</td><td>-5 oz.</td></tr><tr><td>G</td><td>-3 oz.</td></tr></tbody></table> <ul style="list-style-type: none">a. Cake F weighs more than cake G because $-5 > -3$b. Cake G weighs more than cake F because $-3 > -5$c. Cake G and F weigh the same because $-3 = -5$				Cake	Reading	F	-5 oz.	G	-3 oz.	Concrete: (include manipulatives) i.e. – Use a scale to weigh objects. Pictorial: (include drawings, diagrams, charts, or graphs) i.e. – Create a table of objects and their weight. Abstract: (symbolic representations such as numbers or letters) i.e. – Sequence a number sentence to display and explain your findings.	
Cake	Reading												
F	-5 oz.												
G	-3 oz.												
RESOURCES:		VOCABULARY:											
http://www.roberson.k12.nc.us/Page/32959 http://education.ohio.gov http://ccsstoolbox.agilemind.com/parcc/about_middle_3794.html http://www.ixl.com/math/grade-6/compare-and-order-integers		Absolute value Inequality Rational number Greater than Less than											
ESSENTIAL QUESTIONS:													

GRADE: 6		SUBJECT: Math UNIT: Extending the number system	STRAND: The Number System	TRG Math Pacing Guide
CODE: 6.NS.7.c APPLICATION	Description: Understand ordering and absolute value of rational numbers.			
	ACT/Anchor Standard: Reason abstractly and quantitatively Model with mathematics Attend to precision			
	Board Objective: I CAN determine absolute value and whether or not it has a positive or negative value in a real-life situation.			
ASSESSMENTS:		CONCEPT NOTES:		STRATEGIES
Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – “What is the sign for “absolute value”?” Performance tasks: Give real-life story problems related directly to objective i.e. – (see “Apply”)		<p>The emphasis of this standard is to understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation.</p> <p><i>For example, for an account balance of –30 dollars, write $-30 = 30$ to describe the size of the debt in dollars.</i></p> <p>Task Analysis:</p> <ul style="list-style-type: none"> Compare the value of rational numbers on a number line <p>Apply: The Tasty Treats Cake Factory bakes cakes to sell for a grocery chain. Each cake is weighed to see how close it is to the factory’s target weight of 30 ounces. The scale shows how close the cake’s weight is to the target. The scale will display:</p> <p>A positive number if the cake’s weight is over 30 ounces. A negative number if the weight is less than 30 ounces. Zero if the weight is exactly 30 ounces.</p> <p>On Wednesday, the factory records the weights of 5 cakes. The reading with the largest absolute value belongs to: a) the cake that weighs the most, b) the cake closest to target weight, c) the cake furthest from target weight</p>		<p>Concrete: (include manipulatives) i.e. – Use play money to practice value amounts.</p> <p>Pictorial: (include drawings, diagrams, charts, or graphs) i.e. – Compare amounts on a number line.</p> <p>Abstract: (symbolic representations such as numbers or letters) i.e. – Create a numeric sentence like $-30 = 30$ to describe a situation.</p>
RESOURCES:			VOCABULARY:	
http://www.robesson.k12.nc.us/Page/32959 http://education.ohio.gov http://ccsstoolbox.agilemind.com/parcc/middle_3.html			Absolute value Greater than	Inequality Less than Rational number
ESSENTIAL QUESTIONS:				

WHAT IS ABSOLUTE VALUE?

HOW IS ABSOLUTE VALUE USED IN A REAL-LIFE SITUATION?

GRADE: 6		SUBJECT: Math UNIT: Extending the number system	STRAND: The Number System	TRG Math Pacing Guide																		
CODE: 6.NS.7.d APPLICATION	Description: Understand ordering and absolute value of rational numbers.																					
	ACT/Anchor Standard: Reason abstractly and quantitatively Model with mathematics																					
	Board Objective: I CAN apply knowledge of absolute value by expressing rational numbers in absolute value notation.																					
ASSESSMENTS:		CONCEPT NOTES:		STRATEGIES																		
Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – Have students place various values in order. Performance tasks: Give real-life story problems related directly to objective i.e. – (see “Apply”)		The emphasis of the standard is to distinguish comparisons of absolute value from statements about order. <i>For example, recognize that an account balance less than –30 dollars represents a debt greater than 30 dollars.</i> Task Analysis: <ul style="list-style-type: none">Plot rational numbers on a number line that describe real world situationsRecall symbols of inequalities (<, >)Compare the value of rational numbers on a number line Apply: Directions: Use the ranges of positive and negative numbers in the table to create a visual representation of the altitudes that the animals occupy. Then, respond to the statements and questions below. <table><tr><th>Animal</th><th>Minimum Altitude</th><th>Maximum Altitude</th></tr><tr><td>Dolphin</td><td>-300 meters</td><td>0 meters</td></tr><tr><td>Seal</td><td>-90 meters</td><td>9 meters</td></tr><tr><td>Polar Bear</td><td>-6 meters</td><td>6 meters</td></tr><tr><td>Arctic Fox</td><td>0 meters</td><td>15 meters</td></tr><tr><td>Whale</td><td>-3000 meters</td><td>0 meters</td></tr></table>		Animal	Minimum Altitude	Maximum Altitude	Dolphin	-300 meters	0 meters	Seal	-90 meters	9 meters	Polar Bear	-6 meters	6 meters	Arctic Fox	0 meters	15 meters	Whale	-3000 meters	0 meters	Concrete: (include manipulatives) i.e. – Compare the ranges of each animal. Pictorial: (include drawings, diagrams, charts, or graphs) i.e. – Create an illustration to visually communicate the total range where each animal lives. Abstract: (symbolic representations such as numbers or letters) i.e. – Compare the altitudes of two animals by writing a number sentence.
Animal	Minimum Altitude	Maximum Altitude																				
Dolphin	-300 meters	0 meters																				
Seal	-90 meters	9 meters																				
Polar Bear	-6 meters	6 meters																				
Arctic Fox	0 meters	15 meters																				
Whale	-3000 meters	0 meters																				
RESOURCES:			VOCABULARY:																			

http://www.roberson.k12.nc.us/Page/32959 http://education.ohio.gov https://grade6commoncoremath.wikispaces.hcpss.org	Absolute value Greater than	Inequality Less than	Rational number
ESSENTIAL QUESTIONS:			
HOW DO I COMPARE STATEMENTS OF ABSOLUTE VALUE?			

GRADE: 6	SUBJECT: Math UNIT: Relationships in the coordinate plane	STRAND: The Number System	TRG Math Pacing Guide
CODE: 6.NS.C.6.b APPLICATION	Description: Apply and extend previous understandings of numbers to the system of rational numbers.		
	ACT/Anchor Standard: Look for and make use of structure		
	Board Objective: I CAN understand the signs of ordered pairs determine their placement on a coordinate plane.		
ASSESSMENTS:	CONCEPT NOTES:	STRATEGIES	
Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – “What is an ordered pair? Which quadrant would the following ordered pair go into (-3, 2)?” Performance tasks: Give real-life story problems related directly to objective i.e. – 6.NS.6bc Task Amusement Park.doc https://grade6commoncoremath.wikispaces.hcpss.org	<p>The emphasis of this standard is to understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.</p> <p>Students will learn to understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.</p> <p>Using number lines to model negative numbers, prove the distance between opposites, and understand the meaning of absolute value easily transfers to the creation and usage of four -quadrant coordinate grids. Points can now be plotted in all four quadrants of a coordinate grid. Differences between numbers can be found by counting the distance between numbers on the grid. Actual computation with negatives and positives is handled in grade 7.</p> <p>Task Analysis:</p> <ul style="list-style-type: none"> • Identify the x-axis and y-axis on a coordinate plane • Identify the four quadrants on a coordinate plane • Define an ordered pair • Name an ordered pair 	Concrete: (include manipulatives) i.e. – When prompted students will use cut outs of numbers and a negative sign to arrange ordered pairs. Pictorial: (include drawings, diagrams, charts, or graphs) i.e. – Students will use a coordinate plane template to place ordered pairs in proper quadrant (I, II, III or IV). Abstract: (symbolic representations such as numbers or letters) i.e. – Students will be able to properly write ordered pairs from a story problem information.	

	<ul style="list-style-type: none"> Plot an ordered pair. 	
RESOURCES:		VOCABULARY:
http://education.ohio.gov http://www.shodor.org/interactivate/activities/GeneralCoordinates/		rational number x-axis y-axis horizontal vertical ordered pair quadrant
ESSENTIAL QUESTIONS:		
What is the definition of coordinate plane terminology and where are the quadrants located?		

GRADE: 6	SUBJECT: Math UNIT: Relationships in the coordinate plane	STRAND: The Number System	TRG Math Pacing Guide
CODE: 6.NS.C.6.c APPLICATION	Description: Apply and extend previous understandings of numbers to the system of rational numbers.		
	ACT/Anchor Standard: Look for and make use of structure		
	Board Objective: I CAN plot points on a number line or coordinate plane to justify the value and location of opposite integers and ordered pairs.		
ASSESSMENTS:	CONCEPT NOTES:		STRATEGIES

<p>Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – “What is an ordered pair? Which quadrant would the following ordered pair go into (-3, 2)?”</p> <p>Performance tasks: Give real-life story problems related directly to objective i.e. – 6.NS.6bc Task Amusement Park.doc</p> <p>https://grade6commoncoremath.wikispaces.hcpss.org</p>	<p>The emphasis of this standard is to understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.</p> <p>The student will be able to find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.</p> <p>Task Analysis:</p> <ul style="list-style-type: none">Identify the x-axis and y-axis on a coordinate planeIdentify the four quadrants on a coordinate planeDefine an ordered pairName an ordered pairPlot an ordered pairRecognize the ordered pairs that are reflections as equally distant from the x-axis or y-axis.	<p>Concrete: (include manipulatives) i.e. – When prompted students will use cut outs of numbers and a negative sign to arrange ordered pairs.</p> <p>Pictorial: (include drawings, diagrams, charts, or graphs) i.e. – Students will use a coordinate plane template to place ordered pairs in proper quadrant (I, II, III or IV).</p> <p>Abstract: (symbolic representations such as numbers or letters) i.e. – Students will be able to properly write ordered pairs from a story problem information.</p>										
<p>RESOURCES:</p> <p>http://www.roberson.k12.nc.us/Page/32959 http://education.ohio.gov https://grade6commoncoremath.wikispaces.hcpss.org</p>		<p>VOCABULARY:</p> <table><tr><td>Origin</td><td>plot</td><td>coordinates</td><td>coordinate plane</td></tr><tr><td>Intersection</td><td>point</td><td>x-coordinate</td><td>y-coordinate</td></tr></table>			Origin	plot	coordinates	coordinate plane	Intersection	point	x-coordinate	y-coordinate
Origin	plot	coordinates	coordinate plane									
Intersection	point	x-coordinate	y-coordinate									
<p>ESSENTIAL QUESTIONS:</p> <p>What is the definition of coordinate plane terminology and where are the quadrants located?</p>												

GRADE: 6	SUBJECT: Math UNIT: Relationships in the coordinate plane	STRAND: Geometry	TRG Math Pacing Guide
CODE: 6.G.A.3 APPLICATION,	Description: Solve real-world and mathematical problems involving area, surface area, and volume.		
	ACT/Anchor Standard: Look for and make use of structure		
	Board Objective: I CAN graph points on a coordinate plane that create polygons and determine the distances between points.		

ANALYZE, CREATE		
ASSESSMENTS:	CONCEPT NOTES:	STRATEGIES
<p>Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – “What is a polygon?”</p> <p>Performance tasks: Give real-life story problems related directly to objective i.e. – You and your partner are part of a reality game show called <i>Mathematics Adventures in the U.S.</i> Your job is to map out a plan for a route in your city using the coordinate plane.</p>	<p>The emphasis of this standard is to draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.</p> <p>Task Analysis:</p> <ul style="list-style-type: none"> • Identify the x-axis and y-axis of a coordinate plane • Identify the four quadrants of a coordinate plane • Number the axes with positive and negative integers • Identify the ordered pair of a point that is located on the coordinate plane • Graph points on a coordinate plane • Identify ordered pairs as vertices of polygons on a coordinate plane • Find the distance between two points that have the same x or y value • Create real world and mathematical problems which include finding the area of graphed polygons 	<p>Concrete: (include manipulatives) i.e. – Use geometric polygons manipulatives.</p> <p>Pictorial: (include drawings, diagrams, charts, or graphs) i.e. – Relate the coordinate plane to a map.</p> <p>Abstract: (symbolic representations such as numbers or letters) i.e. – Students will explain their solution from the performance task in a geometric representation (using numbers/symbols).</p>
RESOURCES:	VOCABULARY:	
http://www.roberson.k12.nc.us/Page/32959 http://education.ohio.gov http://illuminations.nctm.org/LessonDetail.aspx?id=L280	Polygon Triangle	Quadrilateral Vertex Area Vertices
ESSENTIAL QUESTIONS:		
HOW CAN I USE VERTICES AND ORDERED PAIRS TO FIND THE DISTANCE BETWEEN TWO POINTS ON A COORDINATE PLANE?		

GRADE: 6	SUBJECT: Math UNIT: Algebraic expressions	STRAND: Expressions and Equations	TRG Math Pacing Guide
CODE:	Description: Apply and extend previous understandings of arithmetic to algebraic expressions.		
6.EE.A.1	ACT/Anchor Standard: Reason abstractly and quantitatively Use appropriate tools strategically Attend to precision		

APPLICATION	Look for and make use of structure			
	Board Objective: I CAN write and evaluate expressions involving whole number exponents.			
ASSESSMENTS:	CONCEPT NOTES:			STRATEGIES
<p>Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – “Write three squared in exponential form.”</p> <p>Performance tasks: Give real-life story problems related directly to objective i.e. – Create a bingo game. Students will write a multiplication problem in exponential form or take a problem in exponential form and write it as a multiplication problem.</p>	<p>The emphasis of this standard is to write and evaluate numerical expressions involving whole-number exponents.</p> <p>The skills of reading, writing and evaluating expressions are essential for future work with expressions and equations, and are a Critical Area of Focus for Grade 6. In earlier grades, students added grouping symbols () to reduce ambiguity when solving equations. Now the focus is on using () to denote terms in an expression or equation. Students should now focus on what terms are to be solved first rather than invoking the PEMDAS rule. Likewise, the division symbol ($3 \div 5$) was used and should now be replaced with a fraction bar ($3/5$). Less confusion will occur as students write algebraic expressions and equations if x represents only variables and not multiplication. The use of a dot or parentheses between number terms is preferred.</p> <p>Task Analysis:</p> <ul style="list-style-type: none"> • Identify the base and the exponent in exponential notation • Explain the meaning of a number raised to a power • Convert from expanded form to exponential form • Convert from exponential form to expanded form • Evaluate numerical expressions (that include whole number exponents) 			<p>Concrete: (include manipulatives) i.e. – Use algebra tiles.</p> <p>Pictorial: (include drawings, diagrams, charts, or graphs) i.e. – Use multiplication tables.</p> <p>Abstract: (symbolic representations such as numbers or letters) i.e. – Students will be able to create and solve expressions by information given in a story problem.</p>
RESOURCES:		VOCABULARY:		
http://www.mathgoodies.com/lessons/vol7/expressions.html http://www.uen.org/Lessonplan/preview.cgi?LPid=18876		Algebraic expression Squared	Exponent Cubed	Base Evaluate Variable Power Coefficient
ESSENTIAL QUESTIONS:				
HOW CAN I EVALUATE WHOLE NUMBER EXPRESSIONS INVOLVING EXPONENTS?				

GRADE: 6	SUBJECT: Math UNIT: Algebraic expressions	STRAND: Expressions and Equations	TRG Math Pacing Guide
CODE:	Description: Apply and extend previous understandings of arithmetic to algebraic expressions		

6.EE.A.2.a APPLICATION	ACT/Anchor Standard: Make sense of problems and persevere in solving them Reason abstractly and quantitatively Attend to precision Look for and make use of structure		
	Board Objective: I CAN read, write, and evaluate expressions using letters.		
ASSESSMENTS:	CONCEPT NOTES:		STRATEGIES
Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – “Create and solve an expression using one variable.” Performance tasks: Give real-life story problems related directly to objective i.e. – 6.EE.2 Writing Expressions Notes https://grade6commoncoremath.wikispaces.hcpss.org	The emphasis of this standard is to write, read, and evaluate expressions in which letters stand for numbers. Students will write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation “Subtract y from 5” as $5 - y$. Provide opportunities for students to write expressions for numerical and real-world situations. Write multiple statements that represent a given algebraic expression. For example, the expression $x - 10$ could be written as “ten less than a number,” “a number minus ten,” “the temperature fell ten degrees,” “I scored ten fewer points than my brother,” etc. Students should also read an algebraic expression and write a statement. Through modeling, encourage students to use proper mathematical vocabulary when discussing terms, factors, coefficients, etc. Task Analysis: <ul style="list-style-type: none">Define the parts of an algebraic expression using mathematical termsWrite an algebraic expression from a verbal expressionUnderstand that order is important when writing subtraction and division expressions		Concrete: (include manipulatives) i.e. – Students can use charades cards to practice: 6.EE.2 Expression Charades.doc https://grade6commoncoremath.wikispaces.hcpss.org Pictorial: (include drawings, diagrams, charts, or graphs) i.e. – Use multiplication tables. Abstract: (symbolic representations such as numbers or letters) i.e. – Students will be able to create and solve expressions by information given in a story problem.
RESOURCES:		VOCABULARY:	
http://www.roberson.k12.nc.us/Page/32959 http://education.ohio.gov		Factor Quantity Substitution Order of operations	
ESSENTIAL QUESTIONS:			
HOW TO I CREATE EXPRESSION USING VARIABLES?			

GRADE: 6		SUBJECT: Math UNIT: Algebraic expressions	STRAND: Expressions and Equations	TRG Math Pacing Guide
CODE: 6.EE.A.2.b APPLICATION	Description: Apply and extend previous understandings of arithmetic to algebraic expressions			
	ACT/Anchor Standard: Make sense of problems and persevere in solving them Reason abstractly and quantitatively Attend to precision Look for and make use of structure			
	Board Objective: I CAN identify parts of an expression using the correct terms.			
	ASSESSMENTS:	CONCEPT NOTES:	STRATEGIES	
Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – “Write 3+d in words.” Performance tasks: Give real-life story problems related directly to objective i.e.– (see strategies) $2(8+7)$ Write this expression in another way using mathematical symbols.		The emphasis of this standard is to identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, and coefficient); view one or more parts of an expression as a single entity. <i>For example, describe the expression $2(8+7)$ as a product of two factors; view $(8+7)$ as both a single entity and a sum of two terms.</i> Task Analysis: <ul style="list-style-type: none"> Understand that a number and variable written together means to multiply Explain how expressions such as $3(2+6)$ is the product of two factors (3 times 8) Substitute values for variables in algebraic expressions Evaluate expressions using the order of operations in real world situations 		Concrete: (include manipulatives) i.e. – Illustrate this expression using manipulatives. Pictorial: (include drawings, diagrams, charts, or graphs) i.e. – Students will create a poster of terms, definitions and their corresponding symbols. Abstract: (symbolic representations such as numbers or letters) i.e. – given the expression $x + x + x + x + 4 \cdot 2$, students could write $2x + 2x + 8$ Using correct vocabulary, write this expression in words.
RESOURCES:			VOCABULARY:	
http://www.roberson.k12.nc.us/Page/32959 http://education.ohio.gov			Substitution Order of operations	Squared Coefficient
ESSENTIAL QUESTIONS:				
WHAT ARE THE DIFFERENT PARTS OF AN EXPRESSION?				
HOW ARE THESE TERMS USED IN REAL-LIFE SCENARIOS?				

GRADE: 6	SUBJECT: Math UNIT: Algebraic expressions	STRAND: Expressions and Equations	TRG Math Pacing Guide
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CODE: 6.EE.A.2.c APPLICATION	Description: Apply and extend previous understandings of arithmetic to algebraic expressions		
	ACT/Anchor Standard: Make sense of problems and persevere in solving them Reason abstractly and quantitatively Attend to precision Look for and make use of structure		
	Board Objective: I CAN use the order of operations to solve an expression.		
	ASSESSMENTS:	CONCEPT NOTES:	STRATEGIES
Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – “What is the order of operations?” Performance tasks: Give real-life story problems related directly to objective i.e. – 6.EE.2c Task My First Fish Tank.doc https://grade6commoncoremath.wikispaces.com/6.EE.2c Task My First Fish Tank.doc https://grade6commoncoremath.wikispaces.com/6.EE.2c Task My First Fish Tank.doc	The emphasis of this standard is to write, read, and evaluate expressions in which letters stand for numbers. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). <i>For example, use the formulas $V = s^3$ and $A = 6s^2$ to find the volume and surface area of a cube with sides of length $s = \frac{1}{2}$</i> Task Analysis: <ul style="list-style-type: none"> Substitute values for variables in algebraic expressions Evaluate expressions using the order of operations in real world situations 		Concrete: (include manipulatives) i.e. – Pictorial: (include drawings, diagrams, charts, or graphs) i.e. – Abstract: (symbolic representations such as numbers or letters) i.e. –
RESOURCES:		VOCABULARY:	
http://www.roberson.k12.nc.us/Page/32959 http://education.ohio.gov		Substitution Order of operations Cubed Power	Squared Coefficient Quantity Factor
ESSENTIAL QUESTIONS:			
HOW DO I USE THE ORDER OF OPERATIONS?			

GRADE: 6	SUBJECT: Math UNIT: Algebraic expressions	STRAND: Expressions and Equations	TRG Math Pacing Guide
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CODE: 6.EE.A.3 APPLICATION	Description: Apply and extend previous understandings of arithmetic to algebraic expressions				
	ACT/Anchor Standard: Reason abstractly and quantitatively Model with mathematics Attend to precision Look for and make use of structure				
	Board Objective: I CAN apply the properties of mathematical operations to find equivalent expressions.				
ASSESSMENTS:		CONCEPT NOTES:		STRATEGIES	
Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – “What is the distributive property?” Performance tasks: Give real-life story problems related directly to objective i.e. – Use the distributive property to evaluate: $24x+18y$		The emphasis of this standard is to apply the properties of operations to generate equivalent expressions. <i>For example, apply the distributive property to the expression $3(2 + x)$ to produce the equivalent expression $6 + 3x$; apply the distributive property to the expression $24x + 18y$ to produce the equivalent expression $6(4x + 3y)$; apply properties of operations to $y + y + y$ to produce the equivalent expression $3y$.</i> Task Analysis: <ul style="list-style-type: none">Recognize, convert and apply the additive identity property of zero and the multiplicative property of oneRecognize, convert and apply the commutative property of addition and multiplicationRecognize, convert and apply the associative property of addition and multiplicationRecognize, convert and apply the distributive propertyGenerate equivalent equations using the distributive property		Concrete: (include manipulatives) i.e. – Use algebra tiles. Pictorial: (include drawings, diagrams, charts, or graphs) i.e. – Abstract: (symbolic representations such as numbers or letters) i.e. – I chose Nike (NKE) as my stock. On Monday the stock dropped 3.8 points. My stock experienced a total of p points the next 4 days. My expression would look like this. $8(-3.8 + p)$ p = points gained or lost	
RESOURCES:		VOCABULARY:			
http://www.roberson.k12.nc.us/Page/32959 http://education.ohio.gov		Distributive property Identity property of one Additive inverse	Commutative property Identity property of zero Equivalent expressions	Associative property Multiplicative inverse	
ESSENTIAL QUESTIONS:					
HOW DO I USE THE DISTRIBUTIVE PROPERTY TO CREATE AN EQUIVALENT EXPRESSION?					

GRADE: 6	SUBJECT: Math UNIT: Algebraic expressions	STRAND: Expressions and Equations	TRG Math Pacing Guide
CODE:	Description: Apply and extend previous understandings of arithmetic to algebraic expressions		

6.EE.A.4	ACT/Anchor Standard: Make sense of problems and persevere in solving them Attend to precision. Look for and make use of structure		
	Board Objective: I CAN identify when two expressions are equivalent.		
ASSESSMENTS:	CONCEPT NOTES:		STRATEGIES
Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – Performance tasks: Give real-life story problems related directly to objective i.e. – Students should be asked to create their own expression. The expression should have at least 6 terms and at least two variables. Once the expression is created, have students exchange their exit tickets and simplify one of their classmate's expressions.	The emphasis of this standard is to identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). <i>For example, the expressions $y + y + y$ and $3y$ are equivalent because they name the same number regardless of which number y stands for.</i> Task Analysis: <ul style="list-style-type: none"> • Identify like terms • Combine like terms • Determine equivalence by substituting values for variables Students should be comfortable with simplifying expressions that include multiple terms. The expressions should include both positive and negative terms. When given a simplified expression, students should also be able to create an equivalent expression that is not in simplified form.		Concrete: (include manipulatives) i.e. – colored blocks, shapes, colored chips, etc Pictorial: (include drawings, diagrams, charts, or graphs) i.e. – Abstract: (symbolic representations such as numbers or letters) i.e. –
RESOURCES:	VOCABULARY:		
http://www.teachervision.fen.com/algebra/printable/6192.html	Equivalent Substitution	Like terms Coefficient	
ESSENTIAL QUESTIONS:			
HOW DO I KNOW IF TWO EXPRESSIONS ARE EQUIVALENT?			

GRADE: 6	SUBJECT: Math UNIT: Understanding, writing &	STRAND: Expressions and Equations	TRG Math Pacing Guide
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		solving equations and inequalities		
CODE: 6.EE.B.5 APPLICATION	Description: Reason about and solve one-variable equations and inequalities.			
	ACT/Anchor Standard: Attend to precision. 7. Look for and make use of structure.			
	Board Objective: I CAN substitute a given value into an algebraic equation or an inequality to determine whether it is a part of the solution set.			
ASSESSMENTS:		CONCEPT NOTES:		STRATEGIES
<p>Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – “What is the difference between an expression and an equation?”</p> <p>Performance tasks: Give real-life story problems related directly to objective i.e. –</p>		<p>The emphasis of this standard is to reason about and solve one-variable equations and inequalities. The student will understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.</p> <p>The skill of solving an equation must be developed conceptually before it is developed procedurally. This means that students should be thinking about what numbers could possibly be a solution to the equation before solving the equation.</p> <p><i>For example, in the equation $x + 21 = 32$ students know that $21 + 9 = 30$ therefore the solution must be 2 more than 9 or 11, so $x = 11$.</i></p> <p>Task Analysis:</p> <ul style="list-style-type: none"> • Use substitution • Use substitution to determine whether a given number in a specified set will make a true mathematical statement <p>An expression is a mathematical sentence that has numbers and/variables and at least one operation (+, −, ÷, ×). An equation is a mathematical sentence that contains the equal sign.</p>		<p>Concrete: (include manipulatives) i.e. – colored blocks, shapes, colored chips, etc.</p> <p>Pictorial: (include drawings, diagrams, charts, or graphs) i.e. –</p> <p>Abstract: (symbolic representations such as numbers or letters) i.e. – Tom wants to buy a pair of shoes and a t-shirt. The shoes cost \$65. He has \$82 to spend.</p> <ol style="list-style-type: none"> 1. Write an inequality to represent this situation. 2. What could the cost of the t-shirt be?
RESOURCES:		VOCABULARY:		
http://www.roberson.k12.nc.us/Page/32959 http://education.ohio.gov		Inequality Equation	Solution set Expression	Inverse operations Variable
ESSENTIAL QUESTIONS:				
WHAT MAKES AN INEQUALITY TRUE?				

GRADE: 6		SUBJECT: Math UNIT: Understanding, writing & solving equations and inequalities		STRAND: Expressions and Equations		TRG Math Pacing Guide	
CODE: 6.EE.B.7 APPLY, ANALYZE, EVALUATE	Description: Reason about and solve one-variable equations and inequalities.						
	ACT/Anchor Standard: Make sense of problems and persevere in solving them Reason abstractly and quantitatively Attend to precision						
	Board Objective: I CAN will solve real world problems by writing and solving one-step equations.						
ASSESSMENTS:		CONCEPT NOTES:				STRATEGIES	
Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – “what is an inverse operation?” Performance tasks: Give real-life story problems related directly to objective i.e. – (see strategies) You are creating a budget for an event. Your income will come from ticket sales. Create a balanced budget.		The emphasis of this standard is to reason about and solve one-variable equations and inequalities. Students will solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p , q and x are all nonnegative rational numbers. When students write equations of the form $x+p=q$ and $px=q$ to solve real-world and mathematical problems, they draw on meanings of operations that they are familiar with from previous grades' work. They also begin to learn algebraic approaches to solving problems. Solving problems by writing and solving equations involves not only an appreciation of how variables are used (6.EE.B.C) and what it means to solve an equation (6.EE.B.5) but also some ability to write, read, and evaluate expressions in which letters stand for numbers (6.EE.A.2). Task Analysis: <ul style="list-style-type: none">• Explain the difference between an algebraic expression and an algebraic equation• Write an equation from a real world situation• Identify the operation in the equation and its inverse operation• Solve one-step equations				Concrete: (include manipulatives) i.e. – Use play money. Pictorial: (include drawings, diagrams, charts, or graphs) i.e. – Make a list of possible sources of expense and income. Abstract: (symbolic representations such as numbers or letters) i.e. – Write an equation to show the minimum number of ticket sales needed for you to break even.	
RESOURCES:				VOCABULARY:			
https://grade6commoncoremath.wikispaces.hcpss.org				One-step equation		Isolate the variable Inverse operations	
ESSENTIAL QUESTIONS:							
WHAT IS THE DIFFERENCE BETWEEN AN EXPRESSION AND AN EQUATION?							

GRADE: 6		SUBJECT: Math UNIT: Understanding, writing & solving equations and inequalities	STRAND: Expressions and Equations	TRG Math Pacing Guide
CODE: 6.EE.B.8 APPLY, ANALYZE	Description: Reason about and solve one-variable equations and inequalities.			
	ACT/Anchor Standard: Model with mathematics Attend to precision			
	Board Objective: I CAN solve real world problems by writing and solving one-step inequalities and graph the solution sets.			
ASSESSMENTS:		CONCEPT NOTES:		STRATEGIES
<p>Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – “Write the inequality prompted.”</p> <p>Performance tasks: Give real-life story problems related directly to objective i.e. – have students act out the inequality to a partner. If the sentence reads “the sum of 4 and m is less than y”, the student should act out $4+m < y$. The partner would then translate this and compare the answer on the board to the card the actor has.</p>		<p>The emphasis of this standard is to write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Students will recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.</p> <p>Task Analysis:</p> <ul style="list-style-type: none"> • Explain the difference between an algebraic equation and an algebraic inequality • Write an inequality from a real world situation • Identify the operation in the inequality and its inverse operation • Solve one-step inequalities • Graph inequalities on a number line <p>Apply: If students have internet access at home, consider having them visit www.sixflags.com/america, choose 5 rides, write the height requirement, translate it to an inequality, and then graph it. For students who do not have internet access, create a resource sheet with the information for 7-9 rides and have students choose 5 to translate and graph.</p>		<p>Concrete: (include manipulatives) i.e. – Use inequality models.</p> <p>Pictorial: (include drawings, diagrams, charts, or graphs) i.e. – Graph using inequality signs (open circle, closed circle)</p> <p>Abstract: (symbolic representations such as numbers or letters) i.e. – If someone has to be at least 42 inches tall to ride a ride, what inequality symbol would you use to define x?</p>
RESOURCES:			VOCABULARY:	
http://www.roberson.k12.nc.us/Page/32959 http://education.ohio.gov			Open circle Less than or equal to	Closed circle Infinite solutions Shading Greater than or equal to Number line diagram

ESSENTIAL QUESTIONS:

How do you know when to use an inequality symbol and when to use an equal sign?

When graphing an inequality, when should a closed circle be used?

GRADE: 6		SUBJECT: Math UNIT: Problem solving with area in 2-D shapes	STRAND: Geometry	TRG Math Pacing Guide
CODE: 6.G.A.1 APPLY, ANALYZE, EVALUATE	Description: Solve real-world and mathematical problems involving area, surface area, and volume.			
	ACT/Anchor Standard: Make sense of problems and persevere in solving them Model with mathematics Attend to precision			
	Board Objective: I CAN find the area of triangles by decomposing rectangles, special quadrilaterals, and polygons.			
ASSESSMENTS:		CONCEPT NOTES:		STRATEGIES
Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – Performance tasks: Give real-life story problems related directly to objective i.e. –		The emphasis of this standard is to find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems. Exploring possible nets should be done by taking apart (unfolding) three-dimensional objects. This process is also foundational for the study of surface area of prisms. Building upon the understanding that a net is the two-dimensional representation of the object, students can apply the concept of area to find surface area. The surface area of a prism is the sum of the areas for each face. Task Analysis: <ul style="list-style-type: none"> • Classify polygons • Find the area of a rectangle • Find the area of a triangle by decomposing rectangles • Find the areas of quadrilaterals and polygons by decomposing into triangles and rectangles • Solve problems involving area in real world context 		Concrete: (include manipulatives) i.e. – Cubes of fractional edge length. Squares that can be joined together used to develop possible nets for a cube. Pictorial: (include drawings, diagrams, charts, or graphs) i.e. – place a composite shape on grid or dot paper Abstract: (symbolic representations such as numbers or letters) i.e. –
RESOURCES:			VOCABULARY:	
http://education.ohio.gov http://illuminations.nctm.org/LessonDetail.aspx?ID=L580			Isosceles trapezoid Decompose	Right trapezoid Compose

ESSENTIAL QUESTIONS:

HOW DO I FIND THE AREA OF TRIANGLE, QUADRILATERALS, AND POLYGONS BY COMPOSING OR DECOMPOSING?

GRADE: 6		SUBJECT: Math UNIT: Problem solving with area in 2-D shapes	STRAND: Expressions and Equations	TRG Math Pacing Guide
CODE: 6.EE.A.2.c EVALUATE	Description: Apply and extend previous understandings of arithmetic to algebraic expressions.			
	ACT/Anchor Standard: Make sense of problems and persevere in solving them Model with mathematics			
	Board Objective: I CAN identify the parts of an algebraic expression and then write, read, and evaluate algebraic expressions.			
ASSESSMENTS:		CONCEPT NOTES:		STRATEGIES
Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – Performance tasks: Give real-life story problems related directly to objective i.e. – 6.EE.2c Task My First Fish Tank.doc https://grade6commoncoremath.wikispaces.hcpss.org		The emphasis of this standard is to evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Students will perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). <i>For example, use the formulas $V = s^3$ and $A = 6 s^2$ to find the volume and surface area of a cube with sides of length $s = \frac{1}{2}$.</i> Task Analysis: <ul style="list-style-type: none">• Define the parts of an algebraic expression using mathematical terms• Write an algebraic expression from a verbal expression• Understand that order is important when writing subtraction and division expressions• Understand that a number and variable written together means to multiply• Explain how expressions such as $3(2+6)$ is the product of two factors (3 times 8)• Substitute values for variables in algebraic expressions• Evaluate expressions using the order of operations in real world situations		Concrete: (include manipulatives) i.e. – Pictorial: (include drawings, diagrams, charts, or graphs) i.e. – Abstract: (symbolic representations such as numbers or letters) i.e. –
RESOURCES:		VOCABULARY:		
http://www.roberson.k12.nc.us/Page/32959 http://education.ohio.gov				
ESSENTIAL QUESTIONS:				
HOW DO I EVALUATE EXPRESSIONS USING THE ORDER OF OPERATIONS?				

GRADE: 6		SUBJECT: Math UNIT: Problem solving with volume and surface area	STRAND: Geometry	TRG Math Pacing Guide
CODE: 6.G.A.4 APPLY, ANALYZE, EVALUATE	Description: Solve real-world and mathematical problems involving area, surface area, and volume.			
	ACT/Anchor Standard: Use appropriate tools strategically Attend to precision Look for and make use of structure			
	Board Objective: I CAN use nets to find the surface area of 3-dimensional figures.			
ASSESSMENTS:		CONCEPT NOTES:		STRATEGIES
Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – “What is a net?” Performance tasks: Give real-life story problems related directly to objective i.e. – Nana is wrapping a birthday present that is 8 inches long, 3 inches wide, and 10 inches high. If Nana bought a roll of wrapping paper that is 1 foot wide and 2 feet long, does she have enough wrapping paper to wrap the birthday present?		The emphasis of this standard is to represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems. Task Analysis: <ul style="list-style-type: none"> • Explain the difference between 2-dimensional and 3-dimensional figures • Name the solid figures using the terms prism and pyramid along with the shape of the base • Recognize that a net is a 2-dimensional representation of a 3-dimensional figure • Match the net to the corresponding 3-dimensional figure • Recognize that parallel lines on the net are congruent • Use the dimensions of the individual faces, calculate the area of each rectangle and/or triangle and add these sums together to find the surface area of the figure • Apply these techniques in the context of solving real world and mathematical problems 		Concrete: (include manipulatives) i.e. – Use paper nets or Klikkos Pictorial: (include drawings, diagrams, charts, or graphs) i.e. – Abstract: (symbolic representations such as numbers or letters) i.e. –

RESOURCES:	VOCABULARY:			
http://education.ohio.gov http://illuminations.nctm.org/LessonDetail.aspx?id=L570	Net Pyramid	2-dimensional figure Surface area	3-dimensional figure Tetrahedron	Prism Right tetrahedron
ESSENTIAL QUESTIONS:				
What are some strategies that can be used for finding the surface area of problems in the real world?				

GRADE: 6	SUBJECT: Math UNIT: Understanding data distributions	STRAND: Statistics and Probability	TRG Math Pacing Guide
CODE: 6.SP.A.1 APPLY, ANALYZE, EVALUATE, CREATE	Description: Develop understanding of statistical variability.		
	ACT/Anchor Standard: Make sense of problems and persevere in solving them Model with mathematics		
	Board Objective: I CAN create a survey using statistical questions.		
ASSESSMENTS:	CONCEPT NOTES:		STRATEGIES
Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – “Write what you think is a statistical question.” Performance tasks: Give real-life story problems related directly to objective i.e. – “How many pets are owned by Mrs. Green’s students?” Is this question categorical or numerical? Jonas responded that it is	The emphasis of this standard is to recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. <i>For example, “How old am I?” is not a statistical question, but “How old are the students in my school?” is a statistical question because one anticipates variability in students’ ages.</i> Task Analysis: <ul style="list-style-type: none"> • Differentiate between a statistical question and a question that is not statistical • Recognize that answers to statistical questions may vary • Create a survey using statistical questions 		Concrete: (include manipulatives) i.e. – Pictorial: (include drawings, diagrams, charts, or graphs) i.e. – Use a sort table for students to sort statistical and non-statistical questions. Abstract: (symbolic representations such as numbers or letters) i.e. – (see performance task) Miriam responded that it is numerical. Who is correct and why?

categorical.		
RESOURCES:	VOCABULARY:	
http://education.ohio.gov http://nces.ed.gov/nceskids/	Statistical question Survey	Data Poll
ESSENTIAL QUESTIONS:		
WHAT IS THE DIFFERENCE BETWEEN STATISTICAL AND NON-STATISTICAL QUESTIONS?		
GRADE: 6	SUBJECT: Math UNIT: Understanding data distributions	STRAND: Statistics and Probability
		TRG Math Pacing Guide
CODE:	Description: Develop understanding of statistical variability.	
	ACT/Anchor Standard: Make sense of problems and persevere in solving them Model with mathematics	
6.SP.A.2 APPLY, ANALYZE	Board Objective: I CAN interpret a set of statistical data to determine the center, spread, and overall shape.	
ASSESSMENTS:	CONCEPT NOTES:	STRATEGIES

<p>Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – “What is a distribution?”</p> <p>Performance tasks: Give real-life story problems related directly to objective i.e. – Students will formulate a statistical question that could be addressed with data based on a picture or category provided.</p>	<p>The emphasis of this standard is to understand that a set of data collected to answer a statistical question has a distribution that can be described by its center, spread, and overall shape.</p> <p>The concept of mean (concept of fair shares) can be demonstrated visually and kinesthetically by using stacks of linking cubes. The blocks are redistributed among the towers so that all towers have the same number of blocks. Students should not only determine the range and centers of measure, but also use these numbers to describe the variation of the data collected from the statistical question asked. The data should be described in terms of its shape, center, spread (range) and interquartile range or mean absolute deviation (the absolute value of each data point from the mean of the data set). Providing activities that require students to sketch a representation based upon given measures of center and spread and a context will help create connections between the measures and real-life situations.</p> <p>Task Analysis:</p> <ul style="list-style-type: none"> • Read charts and graphs to interpret a set of data • Find central tendencies (mean, median, mode, and range) of a set of data • Graph and chart a given set of statistical data • Determine the center, spread, and overall shape of a given set of data 	<p>Concrete: (include manipulatives) i.e. – Pictorial: (include drawings, diagrams, charts, or graphs) i.e. – Students, in groups of 3, will sort a set of 4 questions into 2 groups – those having variability in the answering data and those that do not (statistical & non-statistical). Given a picture, the group will write a statistical question that could be asked on a sentence strip to be shared. Abstract: (symbolic representations such as numbers or letters) i.e. –</p>
RESOURCES:		VOCABULARY:
http://education.ohio.gov https://grade6commoncoremath.wikispaces.hcpss.org		Variability Spread Distribution Histogram Box plot Central tendency Mean Median Mode Range
ESSENTIAL QUESTIONS:		
HOW DO I USE DATA TO ANSWER A STATISTICAL QUESTION?		

GRADE: 6	SUBJECT: Math UNIT: Understanding data distributions	STRAND: Statistics and Probability	TRG Math Pacing Guide
CODE: 6.SP.A.3	Description: Develop understanding of statistical variability.		
	ACT/Anchor Standard: Make sense of problems and persevere in solving them Model with mathematics		
	Board Objective: I CAN measure the center for a set of data.		
ASSESSMENTS:	CONCEPT NOTES:	STRATEGIES	
Formative: Use dry/erase boards,	The emphasis of this standard is to recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation	Concrete: (include manipulatives)	

<p>exit slips, show of hands. Etc. for quick comprehension checks: i.e. – Find mean, median, mode: 13, 19, 21, 23, 23, 24, 25, 26, 26</p> <p>Performance tasks: Give real-life story problems related directly to objective i.e. –</p>	<p>describes how its values vary with a single number.</p> <p>Task Analysis:</p> <ul style="list-style-type: none">•Formulate questions that can be answered with data•Design and use a plan to collect relevant data•Analyze the data with appropriate methods•Interpret results and draw valid conclusions from the data that relate to the questions posed. <p>Data should be analyzed from many sources, such as organized lists, box-plots, bar graphs and stem-and-leaf plots. This will help students begin to understand that responses to a statistical question will vary, and that this variability is described in terms of spread and overall shape. At the same time, students should begin to relate their informal knowledge of mean, mode and median to understand that data can also be described by single numbers. The single value for each of the measures of center (mean, median or mode) and measures of spread (range, interquartile range, mean absolute deviation) is used to summarize the data.</p>	<p>i.e. – Use rubrics cubes</p> <p>Pictorial: (include drawings, diagrams, charts, or graphs)</p> <p>i.e. –</p> <p>Abstract: (symbolic representations such as numbers or letters)</p> <p>i.e. –</p>				
RESOURCES:		VOCABULARY:				
<p>http://education.ohio.gov</p> <p>http://www.shodor.org/interactivate/lessons/IntroStatistics/</p> <p>http://nlvm.usu.edu/en/nav/category_g_3_t_5.html</p>		Variability	Spread	Distribution	Histogram	Box plot
		Central tendency	Mean	Median	Mode	Range
ESSENTIAL QUESTIONS:						
<p>What are different strategies for measuring the center for a set of data?</p> <p>What are reasons to choose one method of determining the measure of center over another?</p>						

GRADE: 6	SUBJECT: Math UNIT: Analyzing data	STRAND: Statistics and Probability	TRG Math Pacing Guide
CODE:	Description: Summarize and describe distributions.		
	ACT/Anchor Standard: Use appropriate tools strategically Look for and express regularity in repeated reasoning		
6.SP.B.4 APPLY, CREATE	Board Objective: I CAN construct dot plots, box plots, and histograms to display data.		
ASSESSMENTS:	CONCEPT NOTES:	STRATEGIES	

<p>Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. –</p> <p>Performance tasks: Give real-life story problems related directly to objective i.e. –</p>	<p>The emphasis of this standard is to display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p> <p>Task Analysis:</p> <ul style="list-style-type: none"> • Use number lines including fractions and decimals • Determine scale and intervals based on the data presented to create graphs and charts • Define quartile, upper quartile, lower quartile, and inner quartile • Derive the upper quartile, lower quartile, and inner quartile range • Construct dot plots, box plots, and histograms to display data 	<p>Concrete: (include manipulatives) i.e. –</p> <p>Pictorial: (include drawings, diagrams, charts, or graphs) i.e. –</p> <p>Abstract: (symbolic representations such as numbers or letters) i.e. –</p>
RESOURCES:		VOCABULARY:
http://www.roberson.k12.nc.us/Page/32959 http://education.ohio.gov		Dot plot Box plot Intervals Quartiles Upper quartile Lower quartile Scale Histogram Random sampling Inner quartile
ESSENTIAL QUESTIONS:		

GRADE: 6	SUBJECT: Math UNIT: Analyzing data	STRAND: Statistics and Probability	TRG Math Pacing Guide
CODE: 6.SP.B.5.a	Description: Summarize numerical data sets in relation to their context.		
	ACT/Anchor Standard: Construct viable arguments and critique the reasoning of others Use appropriate tools strategically Attend to precision Look for and express regularity in repeated reasoning		
	Board Objective: I CAN use numerical data to report observations.		

ASSESSMENTS:	CONCEPT NOTES:	STRATEGIES
<p>Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. –</p> <p>Performance tasks: Give real-life story problems related directly to objective i.e. –</p>	<p>The emphasis of this standard is to summarize numerical data sets in relation to their context by reporting the number of observations.</p> <p>In 5.a-d the students will:</p> <ul style="list-style-type: none"> • Collect data and display that data on tally charts, histograms, and box plots • Quantitatively analyze data to determine measures of center and variability • Use measures of center and variability of data sets to compare data sets 	<p>Concrete: (include manipulatives) i.e. –</p> <p>Pictorial: (include drawings, diagrams, charts, or graphs) i.e. –</p> <p>Abstract: (symbolic representations such as numbers or letters) i.e. –</p>
RESOURCES:	VOCABULARY:	
http://www.roberson.k12.nc.us/Page/32959 http://education.ohio.gov	Dot plot Lower quartile Inner quartile	Box plot Scale Intervals Histogram Quartiles Upper quartile Random sampling
ESSENTIAL QUESTIONS:		

GRADE: 6	SUBJECT: Math UNIT: Analyzing data	STRAND: Statistics and Probability	TRG Math Pacing Guide
CODE:	Description: Summarize numerical data sets in relation to their context.		
6.SP.B.5.b	ACT/Anchor Standard: Construct viable arguments and critique the reasoning of others Use appropriate tools strategically Attend to precision		
	Board Objective: I CAN use units of measure and describe how data was measured.		
ASSESSMENTS:	CONCEPT NOTES:	STRATEGIES	

<p>Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. –</p> <p>Performance tasks: Give real-life story problems related directly to objective i.e. –</p>	<p>The emphasis of this standard is to summarize numerical data sets in relation to their context by describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p>In 5.a-d the students will:</p> <ul style="list-style-type: none"> • Collect data and display that data on tally charts, histograms, and box plots • Quantitatively analyze data to determine measures of center and variability • Use measures of center and variability of data sets to compare data sets 	<p>Concrete: (include manipulatives) i.e. –</p> <p>Pictorial: (include drawings, diagrams, charts, or graphs) i.e. –</p> <p>Abstract: (symbolic representations such as numbers or letters) i.e. –</p>
RESOURCES:		VOCABULARY:
http://www.roberson.k12.nc.us/Page/32959 http://education.ohio.gov		Dot plot Box plot Intervals Quartiles Upper quartile Lower quartile Scale Histogram Random sampling Inner quartile
ESSENTIAL QUESTIONS:		

GRADE: 6	SUBJECT: Math UNIT: Analyzing data	STRAND: Statistics and Probability	TRG Math Pacing Guide
CODE: 6.SP.B.5.c	Description: Summarize numerical data sets in relation to their context.		
	ACT/Anchor Standard:		
	Construct viable arguments and critique the reasoning of others		
	Use appropriate tools strategically		
	Attend to precision		
	Look for and express regularity in repeated reasoning		
	Board Objective: I CAN		

ASSESSMENTS:	CONCEPT NOTES:	STRATEGIES
<p>Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. –</p> <p>Performance tasks: Give real-life story problems related directly to objective i.e. –</p>	<p>The emphasis of this standard is to summarize numerical data sets in relation to their context by giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.</p> <p>In 5.a-d the students will:</p> <ul style="list-style-type: none"> • Collect data and display that data on tally charts, histograms, and box plots • Quantitatively analyze data to determine measures of center and variability • Use measures of center and variability of data sets to compare data sets • Interpret results and draw valid conclusions from the data that relate to the questions posed 	<p>Concrete: (include manipulatives) i.e. –</p> <p>Pictorial: (include drawings, diagrams, charts, or graphs) i.e. –</p> <p>Abstract: (symbolic representations such as numbers or letters) i.e. –</p>
RESOURCES:	VOCABULARY:	
http://www.roberson.k12.nc.us/Page/32959 http://education.ohio.gov	Dot plot Lower quartile Inner quartile	Box plot Scale Histogram Quartiles Upper quartile Random sampling
ESSENTIAL QUESTIONS:		

GRADE: 6	SUBJECT: Math UNIT: Analyzing data	STRAND: Statistics and Probability	TRG Math Pacing Guide
CODE:	Description: Summarize numerical data sets in relation to their context.		
6.SP.B.5.d	ACT/Anchor Standard: Construct viable arguments and critique the reasoning of others Use appropriate tools strategically Attend to precision Look for and express regularity in repeated reasoning		

Board Objective: I CAN					
ASSESSMENTS:		CONCEPT NOTES:			STRATEGIES
Formative: Use dry/erase boards, exit slips, show of hands. Etc. for quick comprehension checks: i.e. – Performance tasks: Give real-life story problems related directly to objective i.e. –		The emphasis of this standard is to summarize numerical data sets in relation to their context by relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered. In 5.a-d the students will: <ul style="list-style-type: none"> • Collect data and display that data on tally charts, histograms, and box plots • Quantitatively analyze data to determine measures of center and variability • Use measures of center and variability of data sets to compare data sets • Interpret results and draw valid conclusions from the data that relate to the questions posed 			Concrete: (include manipulatives) i.e. – Pictorial: (include drawings, diagrams, charts, or graphs) i.e. – Abstract: (symbolic representations such as numbers or letters) i.e. –
RESOURCES:		VOCABULARY:			
http://www.roberson.k12.nc.us/Page/32959 http://education.ohio.gov		Dot plot	Box plot	Intervals	Quartiles Upper quartile
		Lower quartile	Scale	Histogram	Random sampling
		Inner quartile			
ESSENTIAL QUESTIONS:					